



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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ATLANTA, GEORGIA 30303-1257

November 14, 2011

Mr. Michael Annacone
Vice President
Carolina Power and Light Company
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2011004 AND 05000324/2011004

Dear Mr. Annacone:

On September 30, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Unit 1 and 2 facilities. The enclosed integrated inspection report documents the inspection findings, which were discussed on November 14, 2011, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding and two self-revealing findings of very low safety significance (Green). Two of these findings were determined to involve violations of NRC requirements. Additionally, licensee-identified violations which were determined to be of very low safety significance are listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest any NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Brunswick Steam Electric Plant. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Brunswick Steam Electric Plant.

In accordance with 10 CFR 2.390 of the NRC's Rules of Practice, a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Randall A. Musser, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos.: 50-325, 50-324
License Nos.: DPR-71, DPR-62

Enclosure: Inspection Report 05000325, 324/2011004
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to Michael J. Annacone from Randall A. Musser dated November 14, 2011

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2011004 AND 05000324/2011004

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-325, 50-324

License Nos.: DPR-71, DPR-62

Report Nos.: 05000325/2011004, 05000324/2011004

Licensee: Carolina Power and Light (CP&L)

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road, SE
Southport, NC 28461

Dates: July 1, 2011 through September 30, 2011

Inspectors: P. O'Bryan, Senior Resident Inspector
G. Kolcum, Resident Inspector
M. Schwieg, Resident Inspector
T. Morrissey, Senior Resident Inspector, Crystal River
T. Ross, Senior Resident Inspector, Browns Ferry
L. Pressley, Resident Inspector, Browns Ferry
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A. Nielsen, Senior Health Physicist (Section 4OA5)

Approved by: Randall A. Musser, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000325/2011004, 05000324/2011004; 7/1/11 - 9/30/11; Brunswick Steam Electric Plant, Units 1 & 2; Flood Protection Measures, Maintenance Effectiveness.

This report covers a three-month period of inspection by resident inspectors and an announced baseline inspection by regional inspectors. One NRC-identified findings and two self-revealing findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects were determined using IMC 0310, "Components Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A self-revealing Green non-cited violation of TS 5.4.1, Procedures, was identified for failure to implement procedural requirements of the equipment configuration control program to ensure that temporary power cables routed through an open manhole and into the reactor building north RHR (NRHR) room did not adversely impact the flood mitigation function of the storm drain system. This finding resulted in rainwater intrusion into the unit 2 reactor building. Upon discovery of this condition, the licensee resealed the manhole. The condition was entered into the licensee's CAP as AR #483473.

The failure to implement the requirements of the equipment configuration control program to ensure that the temporary cable routing did not adversely impact external flood protection features was a performance deficiency. The performance deficiency was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Protection Against External Factors - Flood Hazards and adversely affected the cornerstone objective in that the temporary change impacted the storm drain system which was credited for external flood protection. Using Inspection Manual Chapter 0609, Significance Determination Process, Attachment 0609.04, Phase 1 Screening Worksheet, the finding screened as very low safety significance (Green) because it: (1) was not a design or qualification deficiency that was confirmed not to affect equipment operability; (2) did not represent a loss of safety function; (3) did not represent an actual loss of a single train of equipment for more than its Technical Specification allowed outage time; (4) did not represent a loss of risk significant non-Technical Specification equipment; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event per table 4b of the worksheet because the leakage did not degrade the RHR system. The cause of the finding was directly related to the appropriately planning work activities cross-cutting aspect in the Work Control component of the Human Performance area because the licensee failed to

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incorporate environmental conditions which may impact plant structures, systems, and components into the temporary change. [H.3(a)] (Section 1R06)

- Green. The inspectors identified a Green non-cited violation of 10 CFR 50 Appendix B, Criteria XVI, Corrective Action, for the licensee's failure to promptly identify and correct a condition adverse to quality related to the Control Room Air Conditioning (AC) system. Specifically, the licensee failed to identify and correct repetitive failures of nonconforming low ambient temperature damper actuators for the 2D control building air cooled condenser unit. This resulted in multiple control building AC refrigerant circuit failures. Upon discovery of the issue, the licensee placed the control building AC system in a safe condition for summer operation and initiated actions to procure acceptable damper actuators prior to the onset of low seasonal temperatures. The condition was entered into the licensee's CAP as AR #462873.

The inspectors determined that the licensee's failure to promptly identify and correct the failures of the 2D control room AC system low ambient temperature damper actuators was a performance deficiency. This finding is more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone, and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the finding reduced the reliability of the control building AC system and its ability to maintain control building equipment within specified temperature limits. The significance of the finding was evaluated using Phase 1 of the significance determination process in accordance with the Inspection Manual Chapter 0609 Attachment 4. The finding was determined to be of very low safety significance (Green) because the finding was a design or qualification deficiency that was confirmed not to affect equipment operability. The cause of this finding was directly related to the cross cutting aspect of thorough evaluation of problems in the Corrective Action Program component of the Problem Identification and Resolution area, because the licensee failed to promptly evaluate the failures of the low ambient temperature damper actuators and eliminate the adverse condition. [P.1(c)] (Section 1R12)

Cornerstone: Barrier Integrity

- Green. A self-revealing Green finding was identified for inadequate maintenance on the overload relay of the unit 2 reactor water cleanup (RWCU) system inlet isolation valve 2-G31-F001. As a result of the inadequate maintenance, the overload relay actuated during operation of the valve under normal conditions, and the valve failed to shut. This was revealed while operators were attempting to isolate the RWCU system on August 2, 2011. After the valve failed to fully shut on August 2, 2011, the licensee shut the valve in series with 2-G31-F001 (2-G31-F004), repaired the overload relay for the 2-G31-F001 valve by installing the correct fasteners, returned the 2-G31-F001 valve to service, and entered the issue into their corrective action program (AR #480063).

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The inadequate maintenance on the 2-G31-F001 valve overload relay was a performance deficiency. The finding was more than minor because it was associated with the Barrier Integrity cornerstone attribute of structure, system, and component (SSC) and Barrier Performance, and it affected the associated cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the finding prevented a primary containment isolation valve from shutting. This finding was evaluated using Inspection Manual Chapter 0609, Significance Determination Process, Phase 1 Worksheet for Containment Barriers. The finding was determined to be of very low safety significance (Green) because the finding: 1) did not only represent a degradation of the radiological barrier function provided for the control room, auxiliary building, spent fuel pool, or the standby gas treatment system, 2) did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere, and 3) did not represent an actual open pathway in the physical integrity of reactor containment. The cause of this finding has no cross-cutting aspect because the maintenance took place in 1992 and is not indicative of current licensee performance. (Section 1R12)

B. Licensee-Identified Violations

Violations of very low safety significance that were identified by the licensee have been reviewed by inspectors. Corrective actions planned or taken by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at rated thermal power (RTP). On July 30, 2011, power was reduced to approximately 40 percent due to an inadvertent trip of the 1A recirculation pump. On July 31, 2011, reactor power was further reduced to approximately 30 percent, the 1A recirculation pump was restarted, and power ascension began. The unit reached RTP on August 3, 2011, and operated at or near full power until August 26, 2011, when power was reduced to approximately 70 percent in preparation for the arrival of Tropical Storm Irene. Power was returned to RTP on August 28, 2011, and operated at or near RTP for the remainder of the inspection period.

Unit 2 began the inspection period at RTP. On July 16, 2011, power was reduced to 53 percent for main steam isolation valve testing and power was returned to RTP on July 17, 2011. Power was reduced to 70 percent on August 26, 2011, in preparation for the arrival of Tropical Storm Irene. Power was returned to RTP on August 29, 2011. On September 2, 2011, power was reduced to approximately 60 percent for power suppression testing. Reactor power was returned to RTP on September 8, 2011, and operated at or near RTP for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

.1 Readiness For Impending Adverse Weather Condition

a. Inspection Scope

On August 26 and 27, 2011, tropical storm force winds were experienced at the plant due to tropical storm Irene passing to the east of the site. Prior to the storm's arrival, inspectors reviewed the licensee's overall preparations for impending adverse weather conditions. The inspectors walked down areas of the plant susceptible to high winds and flooding, including the licensee's emergency alternating current (AC) power systems. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during high winds. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of outstanding work orders and corrective action program items to verify that the licensee properly addressed the issued prior to the storm's arrival.

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b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the three following risk-significant systems:

- Unit 1 A train of the residual heat removal (RHR) system with the B train out of service for maintenance on August 11, 2011;
- Unit 2 B train of the core spray system with the A train out of service for maintenance on September 1, 2011; and
- The unit 1 and unit 2 nuclear and conventional service water systems with the 1A and 1B nuclear service water pumps out of service for maintenance on September 2, 2011.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify that system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Quarterly Resident Inspector Tours

a. Inspection Scope

The inspectors conducted five fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Unit 1 Reactor Building North 20' Elevation 2PFP-RB2-1g;
- Control Building, 49' Elevation, 0PFP-CB-23;
- Unit 2 Reactor Building South 20' Elevation; 2PFP-RB2-1GS;
- Unit 2 Reactor Building North 20' Elevation; 2PFP-RB2-1GN; and
- E1 Switchgear Room 50' Elevation 1PFP-DG-11.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

b. Findings

No findings were identified.

1R06 Flood Protection Measures - Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of manhole MH-2SW, which is subject to flooding and contains cables whose failure could disable risk-significant equipment. The inspectors verified that the cables were not submerged in water, that cables and splices appeared to be intact, and that cable supports were adequate. The inspectors also reviewed the manhole for adequate drainage.

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b. Findings

Introduction: A self-revealing Green non-cited violation of TS 5.4.1, Procedures, was identified for failure to implement procedural requirements of the equipment configuration control program to ensure that temporary power cables routed through an open manhole and into the reactor building north RHR (NRHR) room did not adversely impact the flood mitigation function of the storm drain system. This finding resulted in rainwater intrusion into the unit 2 reactor building.

Description: On August 22, 2011, during a period of heavy rain, the unit 2 operators received an alarm associated with high sump level in the unit 2 reactor building NRHR room. Approximately an inch of water was found on the floor of the NRHR room and its associated sump pump was cycling on and off. Water was found spraying onto the NRHR room cooler and two motor-operated valves. This water emanated from two penetrations in the wall that contained temporary power cables used to support chemical decontamination activities. The cables were traced to an open manhole outside of the reactor building. The manhole (MH-2SW) was open to allow the temporary power cables to be routed from the outside yard, through a cable bunker, and into the reactor building NRHR room. The temporary cables were routed in this manner from April, 2011, until August 22, 2011. During the period of heavy rain, rainwater filled the open manhole, flowed through the cable bunker, and into the reactor building penetration conduits containing the temporary power cables. Both ends of the conduits had been sealed in accordance with plant specification No. 118-003, Fire Barrier and Pressure Boundary Penetration seals. However, the two penetrations in question were designed as fire and secondary ventilation boundary penetrations only, and were not considered hydrostatic barriers.

Additionally, the cable bunker sump pump was found not running due to a malfunctioning float switch. Procedure ADM-NGGC-0106, Configuration Management Program Implementation, requires that temporary changes to plant structures, systems, or components be evaluated for impact on their function. The temporary cable routing affected plant storm drainage and unit 2 reactor building flood protection; however insufficient mitigating features were in place to prevent rain water intrusion into the unit 2 reactor building. The condition was entered into the licensee's corrective action program as AR #483473 and the licensee resealed the manhole.

Analysis: The failure to implement the requirements of the equipment configuration control program to ensure that the temporary cable routing did not adversely impact external flood protection features was a performance deficiency. The performance deficiency was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Protection Against External Factors - Flood Hazards and adversely affected the cornerstone objective in that the temporary change impacted the storm drain system which was credited for external flood protection. Using Inspection Manual Chapter 0609, Significance Determination Process, Attachment 0609.04, Phase 1 Screening Worksheet, the finding screened as very low safety significance (Green) because it: (1) was not a design or qualification deficiency that was confirmed not to affect equipment operability; (2) did not represent a loss of safety function; (3) did not

Enclosure

represent an actual loss of a single train of equipment for more than its Technical Specification allowed outage time; (4) did not represent a loss of risk significant non-Technical Specification equipment; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event per table 4b of the worksheet because the leakage did not degrade the RHR system. The cause of the finding was directly related to the appropriately planning work activities cross-cutting aspect in the Work Control component of the Human Performance area because the licensee failed to incorporate environmental conditions which may impact plant structures, systems, and components into the temporary change. [H.3(a)].

Enforcement: TS 5.4.1, Procedures, requires in part that written procedures shall be implemented covering applicable procedures recommended in Regulatory Guide 1.33, Appendix A, November 1972 (Safety Guide 33, November 1972). Regulatory Guide 1.33, Appendix A, November 1972 (Safety Guide 33, November 1972), Section A, requires written procedures for equipment control. Plant procedure ADM-NGGC-0106, Configuration Management Program Implementation requires that temporary changes to plant structures, systems, or components be evaluated for impact on their function. Contrary to the above, from April 2011 until August 2011, temporary power cables were routed through an open manhole into the unit 2 reactor building without a formal evaluation of the impact on site systems. This resulted in rainwater intrusion into the unit 2 reactor building. Upon discovery of this condition, the licensee resealed the manhole. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as AR #483473, it is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000324/2011004-01, Inadequate Configuration Control Resulted in Rainwater Intrusion into the unit 2 Reactor Building.

1R11 Licensed Operator Regualification Program

a. Inspection Scope

On August 22, 2011, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;

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- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated four degraded performance issues involving the following risk significant systems:

- Unit 2 reactor core isolation cooling system (RCIC) governor valve failure on May 28, 2011, NCR #468283;
- Unit 2 room cooler for the A train of the core spray system circuit breaker tripped on July 7, 2011, NCR #475282;
- Historical performance of the control building air conditioning system; and
- Unit 2 reactor water cleanup (RWCU) isolation valve failure on August 8, 2011, NCR #480063.

The inspectors reviewed events where ineffective equipment maintenance may have resulted in equipment failure or invalid automatic actuations of Engineered Safeguards Systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and verifying appropriate performance criteria for SSCs/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization.

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b. Findings

.1 Inadequate Corrective Actions for Control Building Air Conditioning Failures.

Introduction: The inspectors identified a Green non-cited violation of 10 CFR 50 Appendix B, Criteria XVI, Corrective Action, for the licensee's failure to promptly identify and correct a condition adverse to quality related to the Control Room Air Conditioning (AC) system. Specifically, the licensee failed to identify and correct repetitive failures of nonconforming low ambient temperature damper actuators for the 2D control building air cooled condenser unit. This resulted in multiple control building AC refrigerant circuit failures.

Description: The control room AC system consists of three 50 percent capacity air conditioning subsystems (three separate air conditioners) that provide cooling of control room air. Each AC subsystem contains two refrigerant circuits containing two compressors each. Each refrigerant circuit also contains one low ambient temperature damper. The purpose of the low ambient temperature dampers is to extend the operational envelope of the AC system beyond the standard operational temperatures. By modulating airflow across the condenser coils, the low ambient temperature damper maintains the refrigerant saturated within the desired operating range of temperatures. When the low ambient temperature damper fails to throttle shut in cold weather, the increased cooling can result in the refrigerant pressures dropping below the refrigerant low-pressure trip set point and tripping the associated refrigerant circuit's compressors offline. Additionally, when the dampers fail to open in warm weather, higher refrigerant pressures result in inadequate cooling of the control room.

Several failures of the 2D control room AC system low ambient temperature dampers have occurred:

- June 22, 2010 (NCR #405871)
- February 28, 2011 (NCR #450359);
- March 13, 2011 (WO #1899600); and
- May 2, 2011 (NCR #462873).

However, the licensee did not conduct a formal evaluation of the failures. Previous failures were designated "correct only" in the associated NCRs or work orders and were not recognized as an adverse trend in the equipment's performance. An adverse trend in the equipment's performance would have triggered a formal evaluation of the failures per the licensee's CAP procedure CAP-NGGC-0200, Condition Identification and Screening Process. After the May 2, 2011, failure, the licensee and the damper vendor identified a manufacturing defect with replacement damper actuators. The replacement damper actuators that the licensee installed in the 2D control building AC subsystem during this period of failures were missing a component that would shut off the actuator motor when it reached its full open or full closed position, or when the damper bound. This resulted in the final three failures of the actuators listed above.

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Analysis: The inspectors determined that the licensee's failure to promptly identify and correct the failures of the 2D control room AC system ambient temperature damper actuators was a performance deficiency. This finding was more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone, and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the finding reduced the reliability of the control building AC system and its ability to maintain control building equipment within specified temperature limits. The significance of the finding was evaluated using Phase 1 of the significance determination process in accordance with the Inspection Manual Chapter 0609 Attachment 4. The finding was determined to be of very low safety significance (Green) because the finding was a design or qualification deficiency that was confirmed not to affect equipment operability. The cause of this finding was directly related to the cross cutting aspect of thorough evaluation of problems in the Corrective Action Program component of the Problem Identification and Resolution area, because the licensee failed to promptly evaluate the failures of the low ambient temperature damper actuators and eliminate the adverse condition, P.1(c).

Enforcement: 10 CFR 50, Appendix B, Criteria XVI, states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, from February 2011 to May 2011 the licensee failed to promptly identify and correct a condition adverse to quality regarding nonconforming low ambient temperature damper actuators associated with the 2D control building air cooled condenser unit. This resulted in multiple refrigerant circuit failures in the control building AC system. Upon discovery of the issue, the licensee placed the control building AC system in a safe condition for summer operation and initiated actions to procure acceptable damper actuators prior to the onset of low seasonal temperatures. Because this finding is of very low safety significance (Green) and has been entered into the licensee's CAP as NCR #462873, this violation is being treated as an NCV, consistent with the Section 2.3.2 of the NRC Enforcement Policy: NCV 05000325, 05000324/2011004-02, Inadequate Corrective Actions for Control Building Air Conditioning Failures.

.2 Inadequate Maintenance Results in Containment Isolation Valve Failure

Introduction. A self-revealing Green finding was identified for inadequate maintenance on the overload relay of the unit 2 reactor water cleanup (RWCU) system inlet isolation valve 2-G31-F001. As a result of the inadequate maintenance, the overload relay actuated during operation of the valve under normal conditions, and the valve failed to shut. This was revealed while operators were attempting to isolate the RWCU system on August 2, 2011.

Description. On August 2, 2011, unit 2 operators attempted to isolate the RWCU system by manually shutting the RWCU isolation valves. When attempting to shut the RWCU inlet primary containment isolation valve, 2-G31-F001, the valve did not fully shut. Upon investigation, the licensee found that the overload relay for the valve motor actuated due to loose connections on the B and C phase heater elements. The loose connections

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created a high resistance across the heater elements, actuating the overload relay, and stopping the valve motor. The licensee also found that the causes of the loose connections were improperly sized screws, which were too small to adequately secure the heater elements.

The 2-G31-F001 valve overload relay was last modified in 1992 to change the heater elements. Although records of the 1992 maintenance do not show the reason for the installation of the improperly sized screws, the screws were not the manufacturer supplied screws and most likely were introduced by licensee craft personnel at that time. If the screws were already present during the 1992 maintenance, they were not recognized as inadequate by craft personnel. In either case, in 1992, licensee personnel improperly installed the screws after heater element replacement. After the valve failed to fully shut on August 2, 2011, the licensee shut the valve in series with 2-G31-F001 (2-G31-F004), repaired the overload relay for the 2-G31-F001 valve by installing the correct fasteners, returned the 2-G31-F001 valve to service, and entered the issue into their corrective action program (AR #480063).

Analysis. The inadequate maintenance on the 2-G31-F001 valve overload relay was a performance deficiency. The finding was more than minor because it was associated with the Barrier Integrity cornerstone attribute of SSC and Barrier Performance, and it affected the associated cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the finding prevented a primary containment isolation valve from shutting. This finding was evaluated using Inspection Manual Chapter 0609, Significance Determination Process, Phase 1 Worksheet for Containment Barriers. The finding was determined to be of very low safety significance (Green) because the finding: 1) did not only represent a degradation of the radiological barrier function provided for the control room, auxiliary building, spent fuel pool, or the standby gas treatment system, 2) did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere, and 3) did not represent an actual open pathway in the physical integrity of reactor containment. The cause of this finding has no cross-cutting aspect because the maintenance took place in 1992 and is not indicative of current licensee performance.

Enforcement. This finding did not involve a violation of regulatory requirements, therefore enforcement action does not apply. Because the finding does not involve a violation a regulatory requirements and has very low safety significance, it is identified as FIN 05000324/2011004-03, Inadequate Maintenance Results in a Containment Isolation Valve Failure.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the five maintenance and emergent work activities affecting risk-significant equipment listed

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below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Unit 2 B loop of the RHR system out of service for planned maintenance on July 12, 2011;
- Unit 1 in single loop operation on July 31, 2011;
- Unit 1 B loop of the RHR system out of service for planned maintenance on August 11, 2011;
- #3 emergency diesel generator (EDG) and the 2A conventional service water pump out of service on August 15, 2011; and
- #1 EDG and the 2B standby liquid control system out of service during unit 2 power ascension on September 7, 2011.

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following five issues:

- Past operability of the 2A nuclear service water strainer, NCR #473332;
- Abnormal indications on the #2 EDG automatic voltage regulator, NCR #479567;
- EDG supply fan settings non-conforming condition, NCR #421998;
- Current transformer 1-E2-AH0-50/5A degradation, NCR #480654; and
- 2B conventional service water pump high stator temperature, NCR #485307.

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations, to determine

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whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

b. Findings

No findings were identified.

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility, UFSAR, or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed evaluations for seven changes and additional information, such as drawings, calculations, supporting analyses, the UFSAR, and TS to confirm that the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The seven evaluations reviewed are listed in the List of Documents Reviewed.

The inspectors reviewed samples of changes for which the licensee had determined that evaluations were not required, to confirm that the licensee's conclusions to "screen out" these changes were correct and consistent with 10 CFR 50.59. The sixteen "screened out" changes reviewed are listed in the List of Documents Reviewed.

The inspectors evaluated engineering design change packages for seven material, component, and design based modifications to evaluate the modifications for adverse effects on system availability, reliability, and functional capability. The seven modifications and the affected cornerstones are as follows:

- EC 79467, EDG Collector Rings, Rev. 0 (Mitigating Systems)
- EC 76109, Thru-wall leak in discharge piping from 1A RHR/SW Pump, Rev. 0 (Mitigating Systems)
- EC 75482, Replacement carbon steel corroded bedplates on 2B/2D RHR SW Booster Pumps, Rev. 0 (Mitigating Systems)
- EC 68968: Install New SAMG Diesel Generators, 05/12/2011 (Mitigating Systems)
- EC 64817, MCC 1SA and Enclosure Replacement, Rev. 0 (Mitigating Systems)
- EC 62388, Reconfigure Circuitry for Bus E2 27PK and 27HS Relays, Rev. 0 (Mitigating Systems)
- EC 49058: Emergency 4KV Switchgear Room HVAC Upgrade, 12/07/2009 (Mitigating Systems)

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Documents reviewed included procedures, engineering calculations, modification design and implementation packages, work orders, site drawings, corrective action documents, applicable sections of the living UFSAR, supporting analyses, Technical Specifications, and design basis information. The inspectors additionally reviewed test documentation to ensure adequacy in scope and conclusion. The inspectors review was also intended to verify that all appropriate details were incorporated in licensing and design basis documents and associated plant procedures.

The inspectors also reviewed selected corrective action documents associated with modifications and screening/evaluation issues to confirm that problems were identified at an appropriate threshold, were entered into the corrective action process, and appropriate corrective actions had been initiated and tracked to completion.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following five post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- OPT-10.1.1, RCIC System Operability Test, on July 1, 2011 after planned maintenance on the unit 1 RCIC system;
- OPT-8.2.2B, LPCI/RHR System Operability Test, on July 15, 2011 after planned maintenance on the B loop of the unit 2 RHR system;
- OPT-7.2.4B, Core Spray System Operability Test – Loop B, on August 4, 2011 after planned maintenance on the B loop of the unit 1 core spray system;
- OPT-8.1.4B, RHR Service Water System Operability Test – Loop B, on August 12, 2011 after planned maintenance on the unit 1 RHR service water system; and
- 2OP-18, Core Spray Operating System after corrective action on the 2A core spray pump on August 31, 2011.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following: the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing, and test documentation was properly evaluated. The inspectors evaluated the activities against TS and the UFSAR to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was

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identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety.

b. Findings

No findings were identified.

1R22 Surveillance Testing

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors either observed surveillance tests or reviewed the test results for the following three activities to verify the tests met TS surveillance requirements, UFSAR commitments, inservice testing requirements, and licensee procedural requirements. The inspectors assessed the effectiveness of the tests in demonstrating that the SSCs were operationally capable of performing their intended safety functions.

- OPT-10.16L, Remote Shutdown Panel RCIC Flow Controller, RCIC Manual Turbine Trip, And RCIC Turbine Trip Reset Local Control Operability Test on July 1, 2011;
- OPT-IRM21ER, IRM Channel E Calibration and Functional Test on July 14, 2011; and
- OPT-12.2A, #1 EDG Monthly Load Test on August 2, 2011.

b. Findings

No findings were identified.

.2 In-Service Testing (IST) Surveillance

a. Inspection Scope

The inspectors reviewed the performance of OPT-40.2.7, Testing of Main Steam Isolation Valves for the unit 2 D main steam isolation valve on July 16, 2011, to evaluate the effectiveness of the licensee's American Society of Mechanical Engineers (ASME) Section XI testing program for determining equipment availability and reliability. The inspectors evaluated selected portions of the following areas: 1) testing procedures, 2) acceptance criteria, 3) testing methods, 4) compliance with the licensee's IST program, TS, selected licensee commitments, and code requirements, 5) range and accuracy of test instruments, and 6) required corrective actions.

b. Findings

No findings were identified.

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4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

To verify the accuracy of the PI data reported to the NRC, the inspectors compared the licensee's basis in reporting each data element to the PI definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, Regulatory Assessment Performance Indicator Guideline.

Mitigating Systems Cornerstone

- Residual Heat Removal Mitigating Systems Performance Index (MSPI)

The inspectors sampled licensee submittals for the Residual Heat Removal Mitigating Systems Performance Index (MSPI) performance indicator for the period from the second quarter 2010 through the second quarter of 2011. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection reports for the period to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

Barrier Integrity Cornerstone

- Reactor Coolant System (RCS) Specific Activity

The inspectors reviewed licensee submittals for the Reactor Coolant System Specific Activity performance indicator for the period from the second quarter 2010 through the second quarter of 2011. The inspectors reviewed the licensee's RCS chemistry samples, TS requirements, issue reports, and event reports for the period to validate the accuracy of the submittals.

- Reactor Coolant System Leakage

The inspectors sampled licensee submittals for the Reactor Coolant System Leakage performance indicator for the period from the second quarter 2010 through the second quarter of 2011. The inspectors reviewed the licensee's operator logs, RCS leakage tracking data, issue reports, and event reports for the period to validate the accuracy of the submittals.

b. Findings

No findings were identified.

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4OA2 Identification and Resolution of Problems

.1 Routine Review of items Entered Into the Corrective Action Program

a. Inspection Scope

To aid in the identification of repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed frequent screenings of items entered into the licensee's corrective action program. The review was accomplished by reviewing daily action request reports.

b. Findings

No findings were identified.

.2 Selected Issue Follow-up Inspection: Unit 2 Reactor Water Cleanup System Inlet Orifice Installed Backwards

a. Inspection Scope

On July 28, 2011, the licensee identified that the unit 2 Reactor Water Cleanup (RWCU) system inlet flow was indicating significantly less than the system outlet flow. This issue was entered into the licensee's corrective action program as NCR #479248. On August 3, 2011, the licensee determined the unit 2 RWCU inlet flow orifice was installed backwards. The inspectors reviewed the licensee's apparent cause evaluation (ACE) report for NCR #479248, including the associated corrective action plan, operability determination, and supporting regulatory and technical documents. The inspectors also verified the implementation of all completed corrective actions; and confirmed all outstanding actions were scheduled and being tracked for completion. Furthermore, the inspectors interviewed responsible Engineering, Licensing, and Operations personnel; and observed operators monitor the NUMAC Steam Leak Detection System.

b. Observations and Findings

One finding was identified by the licensee (See Section 4OA7).

The inspectors identified an observation regarding the lack of documentation for one of the "Immediate or Interim Action(s) Taken" described in the ACE for NCR #479248. All of the immediate and/or interim actions listed in the ACE were captured, identified and tracked in the attached corrective action plan, except the action regarding the "Human Performance Review Boards" held by Engineering to discuss system monitoring and operability determination issues. The results of these meetings were also to be provided to Engineering personnel. There was no documentation or corrective action closure to confirm that the lessons learned from these review boards were communicated to responsible Engineering personnel as described in the ACE.

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4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Findings

No findings were identified.

.2 Groundwater Monitoring Update

On August 22, 2011, the inspectors held a teleconference with licensee staff and a State of North Carolina representative to discuss recent groundwater sample results related to a leak of tritiated water from underground piping associated with the unit 1 Condensate Storage Tank (CST). The leak occurred in December 2010 and was repaired upon discovery; however a sample from intermediate-depth monitoring well 111B, located near the leak site, recently showed a tritium concentration of 50,000 pCi/L. This is higher than the previously identified value found in this well (approximately 2,000 pCi/L) and is presumably due to a portion of the CST leak tritium plume entering the well sampling zone. The inspectors noted that the sampling level of this well is in a permeable sand layer approximately 60 feet deep and 5 feet above the top of the Castle-Hayne aquifer. The licensee also provided data indicating that other onsite intermediate-depth monitoring wells have historically shown detectable levels of tritium from various sources, specifically old radwaste line leaks and storm drain stabilization pond (SDSP) contamination. The licensee stated that, due to the permeability of the sand layer for intermediate-depth wells, groundwater monitored by these wells is considered hydrologically connected to the Castle-Hayne aquifer. The licensee has one monitoring well (ESS-53B) near the site boundary approximately 0.33 miles south of the CST line leak that draws water directly from the Castle-Hayne aquifer. The inspectors noted that samples taken from ESS-53B have not shown detectable levels of tritium. The inspectors also noted that although very low concentrations of tritium have been identified periodically in Nancy's Creek immediately adjacent to the BSEP site near the SDSP, all reported values for offsite samples have remained significantly below established regulatory limits. The licensee discussed potential corrective actions including installation of additional wells to directly monitor the Castle-Hayne aquifer and remediation of the groundwater in the vicinity of the CST line leak. NRC inspectors will continue to monitor the licensee's actions in regards to groundwater contamination.

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Publicly available information regarding onsite groundwater monitoring and radionuclide concentrations in the environment near BSEP can be found in the Annual Radiological Environmental Operating Report. The 2010 Annual Report is currently available through the **Agencywide Documents Access and Management System (ADAMS)** at <http://www.nrc.gov/reading-rm/adams.html> (accession number ML11137A053). A 30-day report regarding the CST piping leak is also available through ADAMS (accession number ML110190210).

.3 Periodic Resident Inspector Review of World Association of Nuclear Operators (WANO) Report

The Inspectors and Branch Chief reviewed the WANO report dated February 2011. The report was reviewed to ensure that issues identified were consistent with the NRC perspectives of licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up.

4OA6 Management Meetings

Exit Meeting Summary

An exit meeting with A. Pope and T. Sherrill was conducted by phone on September 20, 2011, to discuss the results of the Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications inspection (Section 1R17). Proprietary information reviewed by the team as part of routine inspection activities was returned to the licensee in accordance with prescribed controls.

On November 14, 2011, the resident inspectors presented the inspection results for all other sections of this report to Mr. Michael Annacone, and other members of the licensee staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection period.

4OA7 Licensee-Identified Violations

The following findings of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as NCVs.

- Technical Specification 5.4.1, Procedures, requires that written procedures shall be implemented covering applicable procedures recommended in Regulatory Guide 1.33, Appendix A, November 1972 (Safety Guide 33, November 1972). Regulatory Guide 1.33, section I (Safety Guide 33, November 1972) requires written procedures for performing maintenance. Contrary to the above, the licensee identified that maintenance procedure OCM-VFC500, Instructions for Repair, Reassembly, and Adjustment of the RCIC Terry Turbine Governor Valve, did not contain adequate guidance for assembling the unit 2 RCIC turbine governor valve. As a result, inadequate maintenance was performed on the unit 2 RCIC governor valve in 2009 in that proper spacing of the valve stem packing spacers was not maintained. This

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inadequate maintenance on the RCIC governor valve led to failure of the valve during quarterly surveillance testing on April 15, 2011. This finding was evaluated by the Regional Senior Reactor Analyst performing a Phase 3 significance analysis. The finding was determined to have a risk lower than $1E-6$, and is GREEN. The short exposure time, and the availability of the severe accident mitigation alternative (SAMA) diesels for battery charging contributed to the low impact of the finding. The results were dominated by loss of the DC bus that powers HPCI, combined with automatic depressurization system (ADS) failures that could lead to high pressure core melt. External Events and Large Early Release Probability were found not to be major contributors to the risk of the finding. As corrective actions, the licensee revised the maintenance procedure and repaired the valve. This issue is in the licensee's CAP as NCR #468283.

- Technical Specification (TS) 3.3.6.1, Primary Containment Isolation Instrumentation, requires that the RWCU high differential flow instrumentation be operable in modes 1, 2, or 3. If the instrumentation is not operable, then TS 3.3.6.1 requires that the RWCU penetration flow path be isolated within 1 hour. Contrary to the above, the licensee identified that the RWCU high differential flow instrumentation was not operable and the penetration flow path was not isolated when the unit entered mode 1 on April 16, 2011 until August 2, 2011, because the RWCU inlet flow sensing element was installed backwards, causing the flow sensing element to be inaccurate. The resulting inaccuracy caused the instrumentation to be unable to isolate within the required TS limit of less than or equal to 73 gallons per minute differential flow. The finding was determined to be of very low safety significance per Appendix A of Inspection Manual Chapter 0609, Significance Determination Process, because the finding: 1) did not only represent a degradation of the radiological barrier function provided for the control room, auxiliary building, spent fuel pool, or the standby gas treatment system, 2) did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere, and 3) did not represent an actual open pathway in the physical integrity of reactor containment. Upon discovery of the condition, the licensee isolated the affected penetration flow path and installed the flow sensing element correctly. The issue is in the licensee's CAP as NCR #479248.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Annacone, Site Vice President
S. Bostic, Supervisor - Major Projects
W. Brewer, Manager – Maintenance
A. Brittain, Manager – Security
J. Burke, Director – Engineering
C. Dunsmore, Manager – Shift Operations
P. Dubrouillet, Manager – Training
L. England, Lead Environmental Specialist
J. Frisco, Plant General Manager
C. George, Manager – Technical Support Engineering
K. Gerald, Superintendent – Mechanical Maintenance
S. Gordy, Manager – Operations
L. Grzeck, Lead Engineer - Technical Support
R. Ivey, Manager – Nuclear Oversight Services
F. Jefferson, Manager – Systems Engineering
J. Johnson, Manager – Environmental and Radiological Controls
M. McGowan, Supervisor - Environmental
M. Millinor, Sr. Chemistry Specialist
P. Mentel, Manager - Support Services
R. Mosier, Communication Specialist
W. Murray, Licensing Specialist
D. Petrusic, Superintendent – Environmental and Chemistry
A. Pope, Supervisor – Licensing and Regulatory Affairs
T. Sherrill, Engineer - Technical Support
T. Silar, Hydrologist, Silar Services Inc.
P. Smith, Superintendent – Electrical, Instrumentation, and Controls Maintenance
M. Turkal, Lead Engineer - Technical Support
J. Vincelli, Superintendent – Radiation Protection
H. Willets, Manager– Design Engineering
E. Wills, Director – Site Operations

NRC Personnel

Randall A. Musser, Chief, Reactor Projects Branch 4, Division of Reactor Projects Region II
G. Kuzo, Sr. Health Physicist - Division of Reactor Safety, Plant Support Branch1
T. Nicholson, Sr. Technical Advisor for Radionuclide Transport - Office of Nuclear Regulatory Research
R. Trojanowski, Sr. Regional Governmental Liaison Officer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000324/2011004-01	NCV	Inadequate Configuration Control Resulted in Rainwater Intrusion into the Unit 2 Reactor Building (Section 1R06)
05000325,0500324/2011004-02	NCV	Inadequate Corrective Actions for Control Building Air Conditioning Failures (Section 1R12)
05000324/2011004-03	FIN	Inadequate Maintenance Results in Containment Isolation Valve Failure (Section 1R12)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0AOP-13.0, Operation during Hurricane, Flood Conditions, Tornado, or Earthquake
0A1-68, Brunswick Nuclear Plant Response to Severe Weather Warnings
0PEP-02.1, Initial Emergency Actions
0PEP-02.6, Severe Weather
0O1-01.03, Non-Routine Activities

Section 1R04: Equipment Alignment

1OP-17, Residual Heat Removal System Operating Procedure
2OP-17, Residual Heat Removal System Operating Procedure
1OP-43, Service Water System Operating Procedure
2OP-43, Service Water System Operating Procedure
1OP-18, Core Spray System Operation Procedure
2OP-18, Core Spray System Operation Procedure

Section 1R05: Fire Protection

0PFP-CB, Control Building Prefire Plans
0PFP-DG, Diesel Generator Building Prefire Plans
0PFP-013, General Fire Plan
1PFP-RB, Reactor Building Prefire Plans Unit 1
2PFP-RB, Reactor Building Prefire Plans Unit 2
0OP-41, Fire Protection and Well Water System
0PT-34.11.2.0, Portable Fire Extinguisher Inspection

Section 1R06: Flood Protection

EGR-NGGC-0351 Condition Monitoring of Structures
EGR-NGGC-0507, Cable Aging Management Activities
EGR-NGGC-0512, Licensing Renewal Aging Management Activities
EGR-NGGC-0156, Environmental Qualification of Electrical Equipment Important to Safety
NRC Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients."
NRC Information Notice 2002-012, "Submerged Safety Related Electrical Cables"
0ENP-54, Building Ventilation Pressure Control Program
0SPP-FBS500, Installation of Fire Barrier, Pressure Boundary Penetration and Water/Moisture Seals
Drawing LL-FB-02103, SH2, Reactor Building Fire Barrier Penetrations RHR-HPCI Room East Wall
Specification 048-001, Installation of Electrical Raceway System
Specification 118-003, Fire Barrier and Pressure Boundary Penetration Seals
Unit 2 Control Room Logs, August 22-23, 2011
Work Order 18113632, Temp power for U/2 Chemical Decon Conduit

Section 1R11: Licensed Operator Requalification

0TPP, Licensed Operator Continuing Training Program

TRN-NGGC-0014, NRC Initial Licensed Operator Exam Development and Administration

2EOP-01-RSP, Reactor Scram Procedure

2EOP-01-RVCP, Reactor Vessel Control Procedure

0PEP-2.1.1, Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency

0PEP-02.1, Initial Emergency Actions

Section 1R12: Maintenance Effectiveness

ADM-NGGC-0101, Maintenance Rule Program

NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants

ADM-NGGC-0203, Preventive Maintenance and Surveillance Testing Administration

EGR-NGGC-0351, Condition Monitoring of Structures

ADM-NGGC-0203, Preventive Maintenance and Surveillance Test Administration

0AP-022, BNP Outage Risk Management

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

ADM-NGCC-0104, Work Management Process

0AI-144, Risk Management

ADM-NGGC-0006, Online EOOS Model

Section 1R15: Operability Evaluations

OPS-NGGC-1305, Operability Determinations

OPS-NGGC-1307, Operational Decision making

Section 1R17: Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications**Full Evaluations**

AR 280052, Main Steam Line Break (MSLB) Release, Closed 05/15/2009

AR 282212, Defeating Auto Trip of CW Intake Pumps, Closed 9/3/2008

AR 301377, 0OI-10.08 Attachment 18 Revision And UFSAR Enhanced, Rev. 84

AR 355253, VFD Control of Reactor Recirc Pumps – Unit 1, REG-NGGC-0010 Rev.12, 50.59 Screen & Evaluation, Rev. 000

AR 377534, Supply Reactor Recircs From the Variable Frequency Drives, Rev. 0

AR 412802, Open Access Door For 2-VA-TB-BDD-3, Rev. 0

AR 468108, Temp Mod Lifting Wire to Inhibit Turbine Trip for Low Condenser Vacuum, Rev. 0

Screened Out Items

AR 260790, Repair Unit 1 Core Spray S-2A-350 Sparger Weld, Rev. 0

AR 277648, HPCI Seal Purge Piping Maintenance Changes, Rev. 0

AR 279453, Revise Procedures For EDG Jacket Water Temp, Rev. 0
 AR 291197, Replace Elbow Upstream of 2-SW-V193 due to thinning, Rev. 0
 AR 291373, FP-85971 Culter-Hammer Contactors/ Relays, Rev. 0
 AR 310070 (EC 71921), DH Jacket Water Heat Exchanger slotting mounting holes, Rev. 0
 AR 312217, Unit 1 Reactor Building Crane Upgrade, REG-NGGC-0010 Rev.11, 50.59 Screen, Rev. 0
 AR 317293, Software Upgrade for Thermo-Westronic Recorders, Rev. 0
 AR 328313, Evaluation of Slope Deficiencies for Various Instrument Lines, Rev. 0
 AR 330990, 2B RHR Pump Leak Repair, REG-NGGC-0010 Rev. 12, 50.59 Screen, Rev. 3
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